

REMARKS

Claims 1 and 18-20 are pending. Claim 1 has been amended to specify that the catalytic combustor is configured to oxidize hydrogen sulfide into sulfur oxide. Support for this amendment can be found, for example, on page 14, paragraph [0051] and page 15, paragraph [0054] of the specification. No new matter has been added by any claim amendment.

Claims 1 and 18-20 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,551,732 ("Xu") in view of Japanese Patent Application Publication No. 2003-317783 ("Shuji") and further in view of U.S. Patent Application Publication No. 2004/0035055 ("Zhu"). According to the Examiner, Xu discloses the claimed invention except for the specific impurity removing means or the combustor of claims 18-20. However, the Examiner contends that Shuji teaches such an impurity removing means having a burner upstream from the absorbing material. Applicants respectfully traverse this rejection.

Claim 1 has been amended to recite, *inter alia*, as follows:

A fuel cell system comprising:

...

an impurity removing means configured to remove an impurity gas from the air, wherein the impurity removing means includes:

a sulfur oxide adsorbing portion having at least one of an adsorbing agent and an absorbing agent of the sulfur oxide, and

a catalytic combustor disposed upstream of the sulfur oxide adsorbing portion and configured to oxidize hydrogen sulfide into sulfur oxide (emphasis added).

In the Response to Arguments section of the Office Action, the Examiner asserts that in one embodiment, air after the burner [70] passes through the impurity removal machine [80] supplied via second branch pipe [27]. The Examiner cites to paragraph [0050] of the computer translation of Shuji for support for this contention. Additionally, the Examiner contends that Fig.

3 of Shuji illustrates that the process air from the burner is fed back to the pipe [27] and then into the impurity removal machine [80].

Contrary to the Examiner's contention, Applicants respectfully submit that the Examiner has misinterpreted the teachings of Shuji based upon a computer translation of Shuji. The computer translation of Shuji previously provided by the Applicants was obtained through the Japanese Patent Office website, but Applicants were not aware of the confusing nature of the translation with respect to paragraphs [0050] and [0051]. Thus, to aid in the understanding of Shuji, Applicants have attached herewith a verified English language translation of paragraphs [0050] and [0051] of Shuji. As stated in the verified English language translation of paragraph [0050], "Air which has passed through the impurity remover (80) is supplied to the combustor (70) through a second branch pipe (27)." As such, Shuji discloses that the combustor 70 is positioned downstream of the impurity remover (80) (i.e., an absorbing agent).

Plus, as shown in the enlarged partial view of Fig. 1 of Shuji (reproduced below with markups), the combustor 70 is illustrated downstream of the impurity remover 80. In Fig. 1, the direction of the arrows (→) indicate the direction of flow within the piping and instrumentation diagram of Fig. 1. The process flow related to branch pipe 27 originates with air blower 23 which supplies the air feed pipe 21. After passing through the impurity remover 80, a first branch pipe 26 branches off from air feed pipe 21. Then after passing through the first gas heater 24, the second branch pipe 27 branches off from the air feed pipe 21 which then recirculates back to the impurity remover 80. After passing through the impurity remover 80, the second branch pipe 27 feeds the flow directly to the combustor 70, positioned downstream from the impurity remover 80.

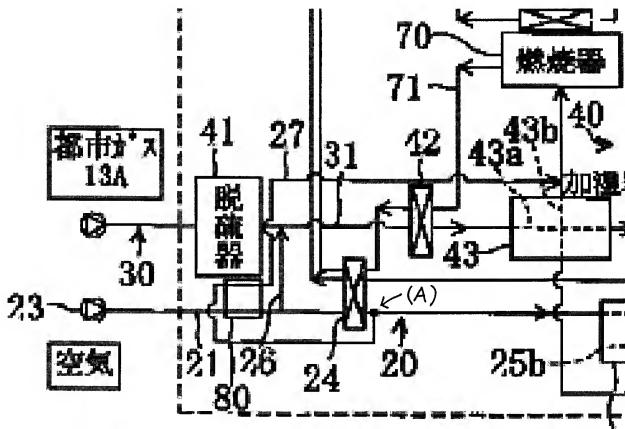


Figure. Enlarged partial view of Fig. 1 of Shuji with markups by Applicants

Moreover, the output stream 71 (combustion gas pipe) does not flow to the impurity remover 80. Thus, it is not possible, in view of Fig. 1, to have any product outputted from the combustor 70 to be processed by the impurity remover 80, as the combustion gas pipe 71 is not physically connected to the impurity remover 80.

With respect to Fig. 3 of Shuji, the branch pipe 27 fed into the impurity remover 80 merely reflects the operational flow as described above. That is, contrary to the Examiner's contention, the branch pipe 27 input into the impurity remover 80 is not from the combustor 70, but stems from the initial branching point (A), as annotated in the above Fig. 1 of Shuji by the Applicants. Thus, for the foregoing reasons, Applicants submit that Shuji does not disclose or

suggest a catalytic combustor disposed upstream of a sulfur oxide adsorbing portion, as recited in claim 1.

Furthermore, Applicants submit that Shuji fails to disclose or suggest a catalytic combustor. While the Examiner contends that Shuji discloses a burner i.e., a combustor 70, the combustor 70 is not a catalytic combustor. As discussed in paragraph [0050] of the verified English language translation of Shuji, the combustor 70 is “an off-gas burner for combusting the hydrogen exhaust gas exhausted from the anode in a fuel cell (10),” as opposed to a catalytic combustor of the instant invention which utilizes a catalyst (see page 14, paragraph [0051] of the specification). This is a key feature of the instant invention, as a catalytic combustor is capable of combusting a tenuous component in a gas mixture. However, the off-gas burner of Shuji can only combust combustible concentrations (i.e., high concentrations) of a gas and is unsuited for combusting tenuous components. The ability to combust tenuous components is important because hydrogen sulfide in air is a very tenuous component and in concentrations typically on the order of parts per million. Thus, for the foregoing reasons, Applicants submit that Shuji fails to disclose a catalytic combustor.

Notwithstanding, claim 1 has been amended to recite that the catalytic combustor is “configured to oxidize hydrogen sulfide into sulfur oxide.” Such conversion for hydrogen sulfide into sulfur oxide is accomplished by a catalytic reaction within the catalytic combustor (see page 15, paragraph [0055] of the specification). In contrast, Applicants can find no disclosure within Shuji disclosing or suggesting that the combustor 70 is configured to oxidize hydrogen sulfide into sulfur oxide.

Thus, for the foregoing reasons, Applicants respectfully submit that Shuji fails to disclose or suggest a catalytic combustor disposed upstream of the sulfur oxide adsorbing portion and configured to oxidize hydrogen sulfide into sulfur oxide. Plus, Xu and Zhu fail to make up for the above-noted deficiencies of Shuji in disclosing or suggesting, either alone or in combination therewith, each and every element of amended claim 1. Accordingly, reconsideration and

Application No. 10/561,778
Reply to Final Office Action of November 4, 2009

withdrawal of the rejection of claim 1 are respectfully requested. In addition, as claims 18-20 depend from claim 1, Applicants respectfully submit that claims 18-20 should be allowed based at least upon their dependency from independent claim 1. Reconsideration and withdrawal of the rejection of claims 18-20 are respectfully requested.

In view of the above Amendments and Remarks, it is submitted that all of the claims in the application patentably distinguish over the prior art of record and are now in full condition for allowance. Reconsideration and an early Notice of Allowance are respectfully solicited.

Respectfully submitted,

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January 22, 2010
(Date)

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Attachments: (1) Verification of Translation and Partial Translation of JP2003-317783.